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November 18, 2019

**BY ELECTRONIC FILING**

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street SW
Washington, DC 20554

Re: *Unlicensed Use of the 6 GHz Band*, ET Docket No. 18-295

Dear Ms. Dortch,

The Fixed Wireless Communications Coalition (FWCC) recently submitted a letter seeking to contradict Broadcom's description of regulatory developments in Europe relating to the authorization of 6 GHz RLAN operations. We found this filing surprising because, although Broadcom and many other advocates for 6 GHz RLAN operations have been deeply involved in the European rulemaking process from the beginning, we are not aware of any engagement in Europe by FWCC or any of its members. In fact, we do not believe that FWCC or its members have attended even one of Europe's many 6 GHz technical discussions, which are led by European regulators and have representation from all of the incumbent services. Perhaps as a result, FWCC appears to fundamentally misunderstand the careful European deliberations and their outcome. In short, the FWCC's analysis is littered with errors.

FWCC's inaccurate description of the European rulemaking process is intended to suggest that European studies somehow support the view that RLAN operations would cause unacceptable levels of interference to FS links. The opposite is true.

The European Conference of Postal and Telecommunications Administrations (CEPT) Electronic Communications Committee (ECC) is moving ahead with plans to begin RLAN operations in the 6 GHz band with the first step of authorizing indoor devices that would not be subject to AFC control—based on the very studies FWCC misinterprets. As a recent ECC newsletter explained:

> [T]he possible opening of the 6 GHz band to WAS/RLAN is gaining momentum within Europe and beyond to provide an adequate amount of spectrum and to use channels with a bandwidth of up to 160 MHz. . . . According to the studies conducted so far, **CEPT expects that compatibility and coexistence between WAS/RLAN and existing**

> **services within and adjacent to the band 5925-6425 MHz is technically feasible** under certain conditions.[1]

ECC Report 302 also reflects this conclusion: "**WAS/RLAN indoor-only usage brings a safe operation to the FS**." FWCC fails to disclose this clear statement to the FCC, and, for an unexplained reason, instead quotes only the passage immediately following it:

> Unfortunately, administrations have no way to control the client AP indoor/outdoor deployment, since they are unlicensed devices. Some additional techniques/restrictions may need to be applied in order to maintain the indoor usage or to mitigate the effect of accidental outdoor use, like a FS data base use for coordination, in particular, a geo-location methods [sic] that aims at detecting a spatial closeness between victim and interferer.[2]

Based on this, FWCC claims "the report supports an AFC function for indoor WAS/RLANs as well as outdoor units."[3] But FWCC misreads the passage. CEPT concludes that measures must be taken to ensure that indoor-only devices remain indoors (i.e., "to maintain the indoor usage") *or* require use of an AFC to prevent harmful interference when devices are taken outdoors. European administrations are considering several measures to ensure that indoor devices are not used outdoors, which are similar to approaches under consideration by the FCC, including prohibitions on battery operation, weatherproof enclosures, or connectorized antennas for indoor-only devices.

FWCC's filing contains several other errors. For example, FWCC repeats its claim that the RKF study "did not use LOS [line-of-sight] when the distance between the RLAN and the FS antenna was short."[4] We first corrected this false assertion more than a year ago in our May 14, 2018 letter.[5] As the RKF study explains, the study used a feature of the WINNER II model that allows RLAN devices to be randomly assigned either line-of-sight or non-line-of-sight propagation conditions with probabilities proportional to their distance from the FS receiver to

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1 *Europe Prepares to Harmonise the 6 GHz Spectrum Band for Radio Local Area Networks*, ECC Newsletter (Aug. 2019), http://apps.cept.org/eccnews/aug2019/europe_prepares_to_harmonise_the_6_ghz_spectrum_band_for_radio_local_area_networks.html (emphasis added).

2 CEPT Electronic Communications Committee, ECC Report 302, 82 (2019) ("ECC Report 302").

3 Letter from Fixed Wireless Communications Coalition to Marlene H. Dortch, Secretary, Federal Communication Commission, ET Docket No. 18-295, GN Docket No. 17-183, at 10 (filed Sept. 3, 2019) ("FWCC Letter").

4 FWCC Letter at 2.

5 Letter from Apple Inc., Broadcom Limited, Cisco Systems, Inc., Facebook, Inc., Google LLC, Hewlett Packard Enterprise, Intel Corporation, Microsoft Corporation, Qualcomm Incorporated, and Ruckus Networks to Marlene H. Dortch, Secretary, Federal Communication Commission, GN Docket No. 17-183, at 10-11 (filed May 14, 2018).

address precisely the situation FWCC highlights.[6] Thus, contrary to FWCC's claim, the RKF report did use line-of-sight propagation for a significant number of RLAN devices, including those within a short distance of the FS receiver. FWCC has never responded to our explanation.

FWCC also claims that the ECC studies assumed that 50% of buildings used traditional (i.e., not thermally efficient) building materials.[7] In fact, the ECC studies made the very conservative assumption that *70%* of buildings would be traditional.[8] Further, FWCC suggests that interference protection criteria used in the European studies would permit "20% of paths" to fail.[9] ECC Report 302 does not support this conclusion in any way. Instead, the report simply incorporates a standard ITU protection criterion that limits I/N levels of greater than -10 dB to 20% of the time for a given FS link. Thus, FWCC's assertion is incorrect in several respects. This interference protection criterion does not authorize *any* harmful interference, because, as the protection criterion itself illustrates, -10 dB I/N does not, in itself, constitute harmful interference. Even if it did, there is no basis for FWCC's assertion that these links would "fail." And finally, contrary to FWCC's claim, the criterion does not relate to the total number of links that may experience a given level of interference. Rather, it restricts the length of time that *a given link* may experience harmful interference.

To help prevent further misunderstandings, we remain open to communications with FWCC and its members. It is our hope that, through increased technical communication, such issues can be addressed without misstatements further confusing the record in this proceeding.

Importantly, however, despite its factual errors and distorted interpretation of the outcome of the European regulatory process overall, FWCC's filing still would not demonstrate that the European studies show a significant risk of harmful interference in the United States, even if its analysis were accurate. Patterns of both FS deployment and RLAN use are very different in these two markets. But accepting, for the sake of argument, that FWCC's extrapolation from European data to the U.S. market is legitimate, it shows only that "478 United States FS links would experience I/N interference exceeding -10 dB."[10] This in no way

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[6] RKF Engineering Services, Frequency Sharing for Radio Local Area Networks in the 6 GHz Band 33-34 (2018), *as attached to* Letter from Paul Margie, Counsel, Apple Inc., Broadcom Corporation, Facebook, Inc., Hewlett Packard Enterprise, and Microsoft Corporation, to Marlene H. Dortch, Secretary, Federal Communication Commission, GN Docket No. 17-183 (filed Jan. 26, 2018).

[7] FWCC Letter at 8.

[8] ECC Report 302 at 85.

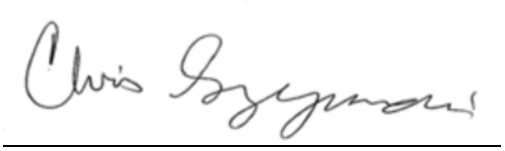
[9] FWCC Letter at 11.

[10] FWCC Letter at 8. We take FWCC's subsequent statement that "[u]nmanaged, the estimated aggregate interference would be unacceptable" to refer to the *statistical* aggregate of 478 per 100,000, rather than aggregate RF interference because FWCC has repeatedly conceded that aggregate RF interference is unlikely to post a risk, including in this very letter. *See* FWCC Letter at 2. *See also, e.g.*, Letter from Fixed Wireless Communications Coalition to Marlene H. Dortch, Secretary, Federal Communication Commission, ET Docket No. 18-295, GN

demonstrates that there will be even a *single* case of harmful interference. Amazingly, FWCC appears to misunderstand the difference between the time-based long-term interference protection criteria recommended by the ITU for the very service that their members operate and the far more conservative single entry I/N criterion being discussed in the United States. Under the ITU standard, FWCC's results do not show that there would be harmful interference because that standard *allows* interference of -10 dB I/N so long as it does not occur more than 20% of the time. Moreover, none of this bears on proceedings in the U.S., which have assumed a significantly different threshold from the -10 dB I/N, 20% of the time ITU standard.

Based on the strong technical record in the U.S., the FCC can confidently move forward enabling indoor low power and very low power portable operations under a simple rule structure to protect the fixed service in U-NII-5 and U-NII-7.

Sincerely,



Chris Szymanski
Director, Product Marketing & Government Affairs
*Broadcom Inc.*

Docket No. 17-183, at 3 (filed Aug. 22, 2019) (emphasizing that FWCC's claimed interference risk "is not due to signal aggregation from multiple devices").